

CLAIMS

1. A shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that the total area of the ejection holes per unit area at a center portion of said shower plate and the total area of the ejection holes per unit area at a peripheral portion thereof differ from each other.

2. A shower plate according to claim 1, characterized in that the total area of the ejection holes per unit area at the center portion of said shower plate is smaller than the total area of the ejection holes per unit area at the peripheral portion thereof.

3. A shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that a hole area of each of the ejection holes at a center portion of said shower plate is smaller than a hole area of each of the ejection holes at a peripheral portion thereof.

4. A shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that the number of the ejection holes per unit area at a center portion of said shower plate is smaller than the number of the ejection holes per unit area at a peripheral portion thereof.

5. A shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that an area of said ejection hole increases in radial direction from the center of said shower plate.

6. shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that the number of the ejection holes per unit area increases in radial direction from the center.

7. A shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that an interval of the ejection holes at a center portion of said shower plate is shorter than an interval of the ejection holes at a peripheral portion thereof.

8. A shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that the ejection holes are arranged concentrically and an interval of the ejection holes at a center portion of said shower plate is shorter than an interval of the ejection holes at a peripheral portion thereof.

9. A shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that a diameter of the ejection hole on the side where the gas flows out of the hole is not more than twice a plasma sheath thickness.

10. A shower plate according to claim 9, characterized in that a diameter of the ejection hole is changed from the side where the gas flows into the hole toward the side where the gas flows out of the hole.

11. A shower plate according to claim 10, characterized in that the diameter on the side where the gas flows out of the hole is not less than 0.02mm and is not more than 10mm.

12. A shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that the ejection hole has a portion, on the side where the gas flows into the hole, having a width which is more than 0.5mm and is not more than 5mm and a portion, on the side where the gas flows out of the hole, having a width which is not less than 0.02mm and is not more than 0.5mm.

13. A shower plate according to claim 12, characterized in that said portion having the width which is not less than 0.02mm and is not more than 0.5mm has a length of 0.2mm to 2mm.

14. A shower plate according to claim 11 or 13, characterized in that said shower plate has a thickness of at least 20mm.

15. A shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that fluctuation in hole diameter of the

ejection holes on the side where the gas flows out of the holes is not more than 1% over the entire shower plate.

16. A shower plate according to claim 15, characterized in that the fluctuation in hole diameter of the ejection holes on the side where the gas flows out of the holes is not more than 0.25% over the entire shower plate.

17. A shower plate according to any one of claims 1 through 15, characterized in that, of both surfaces of said shower plate, at least the surface on the side where the gas flows out is not a flat surface.

18. A shower plate according to claim 17, characterized in that the peripheral portion of the surface of said shower plate on the side where the gas flows out is projected over the center portion thereof.

19. A shower plate according to claim 17, characterized in that the peripheral portion of said shower plate has a thickness greater than that of the center portion.

20. A shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that a center axis of at least a portion, on the side where the gas flows out, of each of at least part of said plurality of ejection holes is inclined with respect to a normal of a surface, which is to face an object to be processed, of at least a center portion of said shower plate.

21. A shower plate according to claim 20, characterized in that inclination of said center axis is set such that the gas is ejected from said at least part of said plurality of ejection holes in a direction towards the center of said shower plate and in a direction towards the side where the object to be processed is to be placed.

22. A shower plate having a plurality of ejection holes adapted to eject a gas, said shower plate characterized in that means for introducing the gas from the exterior to a surface of said shower plate on the side where the gas flows into said ejection holes is provided at a peripheral portion of said shower

plate.

23. A plasma processing apparatus including a shower plate having a plurality of ejection holes adapted to eject a gas, said plasma processing apparatus characterized in that the total area of the ejection holes per unit area at a center portion of said shower plate is smaller than the total area of the ejection holes per unit area at a peripheral portion thereof.

24. A plasma processing apparatus including a shower plate having a plurality of ejection holes adapted to eject a gas, said plasma processing apparatus characterized in that a hole area of each of the ejection holes at a center portion of said shower plate is smaller than a hole area of each of the ejection holes at a peripheral portion thereof.

25. A plasma processing apparatus including a shower plate having a plurality of ejection holes adapted to eject a gas, said plasma processing apparatus characterized in that the number of the ejection holes per unit area at a center portion of said shower plate is smaller than the number of the ejection holes per unit area at a peripheral portion thereof.

26. A plasma processing apparatus according to any one of claims 23 through 25, characterized by including the shower plate in which an area of said ejection hole increases in radial direction from the center thereof.

27. A plasma processing apparatus according to any one of claims 23 through 25, characterized by including the shower plate in which the number of the ejection holes per unit area increases in radial direction from the center thereof.

28. A plasma processing apparatus characterized by comprising the shower plate according to any one of claims 1 through 22.

29. A product manufacturing method characterized by carrying out a process using the shower plate according to any one of claims 1 through 22, thereby manufacturing a product.

30. A product manufacturing method according to claim 29, characterized in that said product is a semiconductor device.

31. A product manufacturing method according to claim 29, characterized in that said product is a liquid crystal display device or an organic EL display device.